Field Survey on Harbor Facility Damage due to Cyclone NARGIS in Myanmar

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ABSTRACT

Cyclone NARGIS was generated at the north of Indian Ocean and it crossed the Ayeyarwady Delta on May 2nd, 2008. In the largest city in Myanmar, Yangon, its harbor area was damaged in the storm surge generated by the cyclone. The many passengers and cargo ships were sunken into the Yangon river as well as the floating jetties were broken. A field survey was conducted to study on the detail of harbor damages and to mitigate the hazard due to the cyclone. In the paper, the results found in the urgent survey were indicated.

KEY WORDS:  Cyclone NARGIS; storm surge; field survey; Yangon harbor; sunken vessel; break of mooring chain; pontoon damage.

INTRODUCTION

Cyclone NARGIS was generated at the north of Indian Ocean and it crossed the Ayeyarwady Delta on May 2nd,2008. The wind speed in the landing became more than 50m/s and the scale of cyclone seemed to be CATEGORY 4. A huge number of people and houses were severely devastated by the storm surge, high wave and strong wind. In the Yangon, its harbor area was also damaged and the many passenger and cargo ships were sunken into the river. The salvage of ships and recovery of harbor operation is one of the most urgent subjects to mitigate the hazard due to the cyclone. In the paper, the urgent survey in Yangon Harbor were expressed. The following facts are revealed; The maximum tide level was 7 feet above H.W.L.(High Water Level). The huge numbers of ships were sunken in the harbor and almost 39 ships run aground. As the facility damage, the total number of damaged jetties was 24 ( in 37 jetties). The floating pontoons and connection bridges were broken mainly due to the high tide and strong currents. The overflow occurred at a slope sea wall with the height of D.L.+5.7m. There is little damage in the international quay wall. By the lack of harbor facility the capacity of transport between Ayeyarwady Delta and Yangon is completely reduced. In the following sessions, several results were expressed in more detail.

STORM SURGE IN YANGON

Characteristic of Cyclone NARGIS

The cyclone NARGIS changed its direction to west in the north Indian Ocean and landed at the night of May 2nd, 2008 in the Ayeyarwady Delta. On the landing, the wind velocity was more than 50m/s and the cyclone level was counted as the category 4 that was similar to the Hurricane KATRINA (Kawai et al., 2006). When the cyclone approached to Myanmar, the harbor facility in Yangon (the maximum city in Myanmar) also was heavily damaged. Especially almost all floating jetties which were used for the inner water transportation, were drifted into the Yangon river and some of them were sunken. The recovery of destroyed jetties is very important to transfer the emergency goods to the Ayeyarwady Delta. In the paper, the urgent survey of heavily devastated harbor facility is introduced.

Figure 1 shows the route of cyclone center in Myanmar (UNOSAT, 2008). The Yangon harbor is located inside the Yangon River and operates the international and domestic passenger and cargo transportation. The domestic water way is connected to the Ayeyarwady Delta through canals and river navigation route. The white circle in the figure shows the point where the Department of Meteorology and Hydrology , Myanmar measured the inundation depth on the ground. The basic data of cyclone and its damage is shown as follows (OCHA, 2008).

- Maximum wind velocity : 54m/s
- Maximum wind velocity in 1min data : 66m/s
- Central pressure : 962hPa
- Moving speed : 19km/h
- Dead person : 78000
- Missing person : 56000
- Injured person : 20000
- Effected population : 2400000
- Economic loss : about 100milion U$

The maximum devastated cyclone in Bangladesh caused 140000 casualties in 1991. Therefore the cyclone NARGIS damage is ranked as one of the most severe disaster in the South-Asia. The urgent recovery of harbor facility is necessary to re-construct the life style devastated in the river delta area.